

FAA National Software Conference

RTCA/SC-190 CNS/ATM Subgroup

RTCA/SC-190

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Terms of Reference

- Develop guidance material based on DO178B/ED12B for Communication, Navigation and Surveillance (CNS) and Air Traffic Management (ATM) software shown by system safety assessment [SC189/WG53-specified process] to affect the safety of aircraft occupants or airframe in its operational environment. Relevant software integrity assurance standards and approval processes should be taken into account.

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Philosophy

- The regulatory authorities and the aviation community to achieve a common DO/ED document for software considerations and assurance for airborne and CNS/ATM systems.

Schedule

- Draft Document - March 2000
- Resolve issues - June 2000
- Plenary/Industry review - September 2000
- Plenary Web-vote/Resolve issues - January 2001
- Plenary Approval - March 2001

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Product

- Guidelines for the application of DO-178B/ED-12B to the production of CNS/ATM software
 - No more than 25 pages
- Discussion paper reviewing the consistency between DO-178B and IEC 61508 part 3

Outline (1/2)

- Introduction
 - Purpose
 - Scope
 - Relationship to DO-178B
 - Relationship to other standards
 - How to use this document
- Links to Safety and Systems Engineering
 - Linkage to WG53/SC-189
 - Inputs and Outputs

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Outline (2/2)

- Objectives Review
 - Annex A Tables
 - Clarification/difficulties in applying to CNS/ATM systems
 - Guidance alternatives
 - Data collection
- Additional considerations
 - PDS
 - Adaptation

Relationship to other documents

- Linked to DO-178B
 - Produce an equivalent level of software assurance between CNS/ATM and airborne systems
- Other assurance standards
 - Incompatibilities identified
- Other System Safety Assessment processes
 - WG53/SC-189 is an input to this document

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How to use the document (1/2)

- Read section one and two
 - Introduction
 - Links to system safety engineering
- Read section three of DO-178B
 - Software Life Cycle

How to use the document (2/2)

- Read remainder of this document
 - Objectives review
 - Additional considerations
- As questions in application arise, refer to the appropriate DO-178B text as referenced in the objectives tables and notes stated herein.

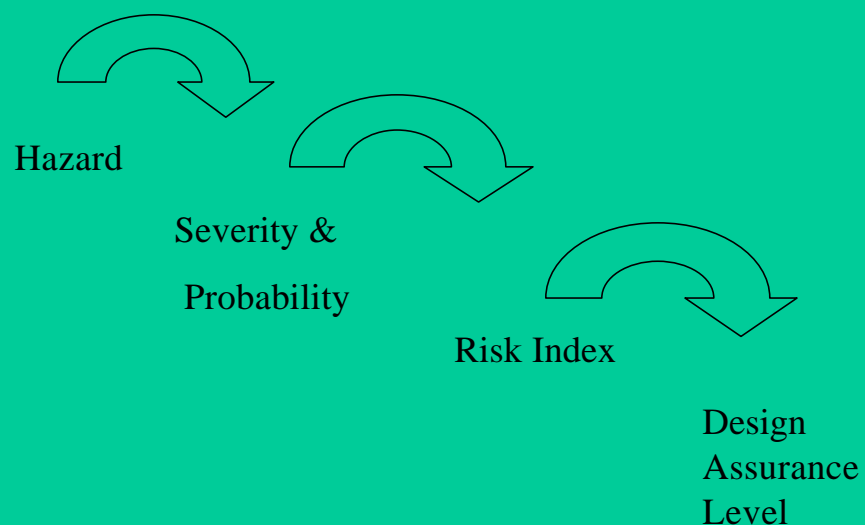
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Links to System Safety

- Purpose
 - Frame of software safety assessment
 - Relationship between system and software
 - Software level allocation
- Allocation of assurance level is the result of a System Safety Assessment. This process is currently being defined within WG53/SC-189

Pathway to Design Assurance



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Objective

- Objectives Table
 - Notes
 - Clarifications/difficulties
 - Guidance on alternatives
 - Data collection

Example Objective

- A1-3, Software life cycle environment is defined
 - Notes, CNS/ATM systems typically operate continuously for many years. The software life cycle plans should address processes for software changes, technology upgrades, specifically with respect to safety issues.

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Additional Considerations (1/2)

- Issues
 - PDS
 - Object Oriented Design
 - Site Adaptation Data
 - Tool Qualification of COTS tools for development
 - Previous Service History
 - Use of Formal Methods

Additional Considerations (2/2)

- Issues
 - Artificial Intelligence and Expert Systems
 - Software Partitioning
 - Interoperability
 - Software Development Planning
 - Testing methods

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Issues

- Scope - Data Link vs. CNS/ATM
- Safety Process - Bridging the gap between RTCA/SC-189 output and DO-178B required input.
- PDS/COTS - new objectives
- Independence

Example Issue

- Independence
 - Person, Department, and Organization
 - Increasing independence based of software level

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Ground-based CAST

- Drafted position on the direction of the RTCA/SC-190 CNS/ATM Subgroup.
- Will become a formal member of the Airborne CAST Team
- Position papers will reflect both an Airborne and Ground-based perspective.

Summary

- 88 total issues identified
 - 44 closed
- On schedule for plenary review in September 2000.
- Release to Aviation Community to review.